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ABSTRACT

This study examined characteristics differentiating defaulters on Stafford student loans (formerly Guaranteed Student Loans) from non-defaulters. Data were drawn from a sample of 100,000 records randomly selected from the fiscal year 1987 guarantee agency cumulative borrower file. A cohort of 7,382 borrowers taking out their last loan in FY 1983 was divided into defaulters and non-defaulters. The relationships of five variables (institution type, adjusted gross income, dependent/independent status, enrollment status--graduated or withdrew, and years of schooling completed) with each other and with default/non-default status were examined. The study also provides cohort default rates for various borrower subpopulations based on a large, national random sample, furnishes a comprehensive summary and critique of the literature, and suggests potentially fruitful avenues for further research. (MSE)

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CHARACTERISTICS OF STAFFORD LOAN PROGRAM DEFAULTERS: A NATIONAL SAMPLE

From a nationwide sample of Stafford (formerly Guaranteed Student Loan) borrowers, this paper examines some selected characteristics that differentiate program defaulters from non-defaulters.

A sample extract of 100,000 records randomly selected from the Fiscal Year 1987 guarantee agency cumulative borrower file maintained by the U.S. Department of Education was used as the data base. A cohort of 7,382 borrowers who took out their last loan during FY 1983 and had entered repayment by the end of FY 1987 was selected and subsequently divided into two groups: those who had defaulted and those who had not.

Five independent variables were defined as predictors of the dependent variable, default status: (a) institutional type--public four year, public two year, private four year, private two year, proprietary; (b) adjusted gross income; (c) dependent/independent status; (d) enrollment status -- graduated or withdrew; (e) years of schooling completed.

Through the use of multivariate statistical techniques, the study attempts to examine: (1) the magnitude of the relationship between each independent variable and default status; (2) the interrelationships between the independent variables; (3) the relative effects of each variable on default status when the effects of other variables are held constant; (4) the ability of all variables collectively to account for variation in default status.

This study also provides statistically reliable cohort default rates for various borrower subpopulations based on a large, national random sample. In addition, the paper furnishes a comprehensive summary and critique of the literature, relates its findings with those of other studies, and suggests potentially fruitful future avenues for research.

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CHARACTERISTICS OF STAFFORD LOAN PROGRAM DEFAULTERS: A NATIONAL STUDY

Background

The Stafford Loan Program (formerly the Guaranteed Student Loan Program) has undergone ever closer scrutiny during recent years due to escalating borrower default costs. During Fiscal Year (FY) 1988 approximately $1.4 billion in default claims were paid by the U.S. Department of Education; as recently as FY 1982 annual default claim costs were less than $300 million. The steep rise in default costs is principally due to the dramatic growth in the program rather than the higher proportion of high risk borrowers.

Nevertheless, as default costs increase, it is only natural that more interest is focused on the characteristics of individual borrowers who default. A number of questions have surfaced: Are there identifiable characteristics that sharply differentiate program defaulters from non-defaulters? What is the relative importance of these characteristics and how are they interrelated? Does knowledge of these characteristics significantly improve our ability to predict who will default? How might knowledge of the characteristics associated with default be translated into specific default reduction policies?

Consequently, a number of research studies have emerged. Most have dealt almost exclusively with the first question, i.e., what characteristics are correlated with default. Few studies have addressed a national population; most are based on state or local samples -- a notable exception is the recently published U.S. General Accounting Office report (U.S. General Accounting Office, 1988) hereafter referred to as the GAO Report. Also, few studies have been able to document the employment history of borrowers, a potentially critical explanatory variable, but have been forced to rely solely on variables that appear on state guarantee agency borrower files, such as type of institution, adjusted gross income, and independent/dependent status. Such are the constraints imposed on the current study. Despite these drawbacks, these studies have produced some noteworthy findings.

Purposes of Study

This study, based on a nationally representative sample of Stafford borrowers, attempts to extend the frontiers of research that compare characteristics of defaulters and non-defaulters. The purposes of the study are as follows:

(1) Provide national cohort default rates for various borrower subpopulations.

(2) Examine the relationship between five independent or predictor variables (type of institution attended, adjusted gross income, independent/dependent status, years of schooling completed, enrollment status, i.e., graduated/withdrawn) and the dependent or predicted variable, default status (default/non-default).

(3) Examine the interrelationships between the independent variables and, through cross-tabulation procedures and a multiple regression technique, assess the effects of each independent variable on default status when the effects of other variables are held constant (controlled).

(4) Determine how well the independent variables collectively account for variation in default status.

Methodology

A sample extract of 100,000 records randomly selected from the FY 1987 state guarantee agency cumulative borrower file maintained by the U.S. Department of Education was used as the data base. A cohort of 7,394 borrowers who took out their last loan during FY 1983 and had entered repayment by the end of FY 1987 was selected and subsequently divided into two groups: those who had defaulted and those who had not.

A separate file was created that equated school codes on the borrower file with one of five institutional type categories: public four year, private four year, public two year, private two year, and proprietary. The other four independent variables -- adjusted gross income, independent/dependent status, years of schooling completed, enrollment status (graduated/withdrawn) -- are data fields that appear on the borrower file. Default status (default/non-default), independent/dependent status, and enrollment status (graduated/withdrawn) were treated as dichotomous variables. The adjusted gross income variable measures borrower income for independent students and family income for dependent students. All income data pertain to date of loan application. Years of schooling completed was coded into ordered categories ranging from less than one year (freshmen) to four years or more (graduate students).

The research design closely parallels the design of the recently published GAO Report. There are some significant differences: GAO delineated only three broad types of institutions, i.e., vocational, higher education, and other schools; GAO did not develop a measure of enrollment status; GAO reported results on the total population of borrowers who took out their last loans in FY 1983 rather than a random sample of borrowers; most importantly, the objective of the GAO Report was to provide concise and factual descriptive comparisons of the profiles of defaulters and non-defaulters without elaborate analytic interpretation.

It is not known to what extent the quality of the data reported by the state guarantee agencies could affect the findings reported here. The data have not been verified for accuracy. While data are virtually complete for default status, type of institution, and years of schooling completed, approximately 14 percent of the records have missing data on independent/dependent status, 16 percent on adjusted gross income, and 26 percent on enrollment status.

Cohort Default Rates

A cohort default rate, as distinguished from a cumulative or annual rate (see Hauptman and Smith, 1987 and Merisotis, 1988 for discussions of default rates) was employed in this study. The cohort consists of Stafford

borrowers who took out their last loan during FY 1983 and had entered repayment by the end of FY 1987. All rates reported here are borrower rather than dollar rates. That is, rates are calculated from the percentage of borrowers who default as opposed to the percentage of dollars which default. While there are some advantages to employing default rates by dollar amount -- primarily they reflect more accurately the losses incurred through defaults -- the purposes of this study were better served by focusing on borrowers rather than dollars.

A cohort default rate by category for each of the five independent variables is shown in Table 1. Slightly more than 20 percent of all borrowers who took out their last loans in FY 1983 had defaulted by the end of FY 1987.

Relationships between Independent Variables and Default Status

As shown in Table 1, each of the five independent variables is correlated with default status. Approximately 37 percent of proprietary students and 27 percent of public two-year students default on their loans compared to just over ten percent for the four-year private and four-year public students. Income and years of schooling are inversely related to default: for example, students with incomes of $30,000 or more show a default rate of less than six percent, compared to a default rate of almost 32 percent for borrowers who make less than $5,000; upper division and graduate students experience default rates of less than ten percent while the freshman rate exceeds 33 percent. Approximately 29 percent of independent students default compared with 15 percent of dependent students. Borrowers who graduate from a program of study are less likely to default (16 percent) than those who withdraw (26 percent).

These findings corroborate results from a number of previous studies. However, in order to assess more precisely what role each of the independent variables plays in whether a borrower subsequently defaults, it is necessary to examine the interrelationships among variables. We will begin by evaluating the interrelationship between type of institution and adjusted gross income as it affects default rates.

Type of Institution and Adjusted Gross Income: Effects on Default Rates

Cohort default rates for the five institutional types listed in Table 1 are pictorially displayed in Figure 1. The proprietary school default rate (37.3 percent) is almost four times the rate for traditional four-year institutions. The default rate for the public two-year sector (26.6 percent) is two and one half times the rate for four-year institutions. The high rates for proprietary schools relative to traditional four-year institutions has been well documented (see, for example, Applied Management Sciences, 1986; California Student Aid Commission, 1988; New Jersey Association of Student Financial Aid Administrators, 1988; Illinois State Scholarship Commission, 1988; U.S. General Accounting Office, 1988). Moreover, there is unanimous agreement that higher income borrowers are less likely to default (see California Student Aid Commission, 1988; New Jersey Association of Student Financial Aid Administrators, 1988; Davis, 1988a).

To what extent is the large disparity in default rates between traditional four-year institutions, on the one hand, and the proprietary and community college sectors, on the other, attributable to income differences? Since institutions with the highest default rates also tend to have higher percentages of low income borrowers, perhaps the default rate differences between insitutions would vanish if income was held constant. This hypothesis is examined in Figure 2.

Figure 2 compares default rates for borrowers attending different types of institutions by income category. Two findings stand out: (1) for each type of institution an inverse relationship between income and default rate persists, i.e., as income increases the default rate decreases; (2) for each income category proprietary school default rates are highest, followed by the public two-year sector, and finally the four-year institutions. It is obvious that the type of institution attended affects the default rate even when income is taken into account. That is, income and type of institution attended independently affect the likelihood of default.

Adjusted Gross Income and Independent/Dependent Status: Effects on Default Rates

Adjusted gross income and independent/dependent status are highly correlated. This relationship is displayed in Figure 3: almost 75 percent of borrowers who earn less than $5,000 are independent students while borrowers at the other end of the income spectrum, family incomes of $30,000 and above, are overwhelmingly dependant students (approximately 95 percent). While a number of studies have alluded to the much higher default rates of independent students and the close interplay of independent/dependent status with income, few studies have attempted to isolate the effects of these two variables on default rates. Could it be that the effects on default rates customarily attributed to income are in large measure a function of a borrower's independent/dependent status?

Figure 4 addresses this question. It is readily apparent that a strong inverse relationship between income level and default rate persists even when the analysis is performed separately for independent and dependent borrowers. That is, income still has a significant effect on default rates even when independent/dependent status is controlled. However, the converse does not appear to be the case: the effects of independent/dependent status on default status tend to disappear when income is taken into account. The only qualification to this conclusion occurs among the lowest income grouping (less than $5,000) where independent borrowers show slightly higher default rates. Among all higher income groupings, default rate differences between independent and dependent borrowers are barely discernible.

The evidence presented here reveals that the effects of independent/dependent status on default status have been overstated by earlier studies due to a failure to control for income. Only in the lowest income categories are independent borrowers more inclined to default, and even then the differences are small. The GAO Report attempted to control for income in

assessing the effects of independent/dependent status on likelihood of default, but employed overly large income groupings. This procedure did not control effectively for income and failed to detect the fact that default rate differences between dependent and independent borrowers become insignificant when income is taken into account.

Years of Schooling and Type of Institution: Effects on Default Rates

Numerous studies have documented the association between years of schooling completed and likelihood of default. All these studies show -- consistent with the findings in Table 1 -- freshmen with the highest default rates and graduate students with the lowest default rates (see California Student Aid Commission, 1988; New Jersey Association of Student Financial Aid Administrators, 1988; Davis, 1988b; U.S. General Accounting Office, 1988).

Does years of schooling completed have a significant effect on default rates when type of institution is taken into account? One could argue that, since the institutions with the highest default rates (the proprietary schools and public two-year schools) consist almost exclusively of freshmen and sophomores, the inverse relationship between years of schooling and default status in the total sample may be a function of type of institution. That is, the effects of years of schooling on default status may tend to vanish once we control for type of institution, much in the same way the effects of independent/dependent status disappeared once income was introduced as a control variable.

But, as attested to by Figure 5, such is not the case. For example, among proprietary school borrowers, approximately 41 percent of borrowers with less than one year of postsecondary education default compared to just 24 percent of those who have completed between one and two years of school. The corresponding percentages for the public two-year sector freshmen and sophomores are 32 and 23 percent, respectively. The same types of trends, albeit not as spectacular, are visible for the four-year sectors: among private institutions approximately 18 percent of freshmen default compared to six percent for borrowers who have completed four years of college; among public four-year institutions the corresponding percentages are 17 and eight.

These data clearly show that years of schooling has an independent effect on default status irrespective of the institution attended. Also, default rates for different types of institutions continue to follow the familiar pattern when years of schooling is controlled: proprietary and public two-year institutions show substantially higher rates than four-year institutions for freshmen and sophomore borrowers separately.

Enrollment Status and Type of Institution: Effects on Default Rates

Does graduation from a program of study significantly reduce the likelihood that a borrower will default? There has been less attention paid in the literature to this variable than to income, independent/

dependent status, type of institution, and years of schooling. The default rate difference between those who graduate and those who withdraw is surprisingly small; as seen from Table 1, approximately 26 percent of those who withdraw subsequently default compared to 16 percent of those who graduate.

The interpretation of this variable is somewhat ambiguous. "Withdrawal" should not be equated with "dropout." A record coded as "withdrawal" on a state guarantee agency file simply means that the borrower had withdrawn from the institution where the last loan was disbursed. The same borrower could have subsequently attended another institution and graduated. This may partially explain the modest default rate differences found between the two groups.

Figure 6 displays default rates for the two groups for different types of institutions. For the largest institutional sector -- the public four-year institutions -- the percentage of withdrawals who default (13.3 percent) is not much larger than the percentage of graduates who default (8.5 percent). For the other types of institutions the differences are more pronounced. For example, among private four-year institution borrowers 18 percent of withdrawals default compared to just six percent of graduates; the corresponding percentages for the private two-year sector are 31 and 14, for the public two year, 31 and 21, and for the proprietary, 47 and 30.

Davis's research with Pennsylvania proprietary school borrowers showed sharp differences in default rates between graduates and dropouts (Davis, 1988c). His default rate for graduates is much lower than the rate reported here. Indeed, one of the most striking items in Figure 6 is the 30 percent default rate for borrowers who successfully complete proprietary programs, a figure that easily exceeds the overall percentage of withdrawals who default.

Multiple Regression Analysis

A statistical technique to determine the relative influence of the five independent variables on default status is multiple regression analysis. A standardized regression weight, i.e., a beta weight, is mathematically computed for each of the five independent variables. The weight for a given variable can be interpreted as the standardized effect of that variable on default status when all other independent variables are simultaneously controlled. Multiple regression analysis also permits an estimate of the total variation in the dependent variable (default status) that is accounted for by the collective impact of the independent variables. This estimate is called the coefficient of determination. It derermines how accurately individual values for the dependent variable (whether or not a borrower defaults) can be predicted from knowledge of values on the independent variables.

Multiple regression analysis does require the use of continuous variables or, at the very least, dichotomous variables that approximate

a 50:50 split. The variables defined in this study do not fully meet these requirements. Keeping this caveat in mind, the regression analysis was performed to provide suggestive answers to some of the questions raised earlier.

The dependent variable, default status, was coded as either "0" (non-default) or "1" (default). Type of institution was dichotomized as "0" (proprietary institution) or "1" (all other institutions). Similarly, dependent borrowers were coded "0" and independent borrowers "1", while graduates were coded as "0", withdrawals as "1". Years of schooling and adjusted gross income were treated as continuous variables. Results are shown in Table 2.

From the standardized regression weights listed in Table 2, three variables appear to be about equally influential in predicting whether a borrower will default: adjusted gross income, years of schooling, and type of institution. Thus these three variables separately and independently affect default rates when all other variables are simultaneously controlled. Enrollment status (graduated/withdrawn) and independent/dependent status show much smaller effects, about half as large as the three primary independent variables.

The regression analysis also suggests that the independent variables collectively explain only a small proportion of the variation in default status (approximately 13.6 percent). This means that knowledge of borrower profiles on the independent variables does not ensure consistently accurate estimates of whether these borrowers default. This is due to the fact the overwhelming percentage of borrowers pay back their loans and even in the highest risk segments of the borrower population (e.g., propietary school, freshman, low income, withdrawal) at least 50 percent will pay back their loans. Thus no combination of characteristics studied here is found exclusively among defaulters.

Future Studies

The borrower characteristics discussed here, with the exception of enrollment status, are attributes of the borrower at the time the last loan was disbursed. Yet years may elapse between the date of the last loan and subsequent default on the loan. It is imperative then that measures of borrower characteristics are timely, that they reflect borrower characteristics at the time of repayment or default. One of the obvious candidates is employment status. Results from the National Postsecondary Student Aid Study should provide a rich source of variables for future studies. Imaginative use of these variables could significantly improve predictive power.

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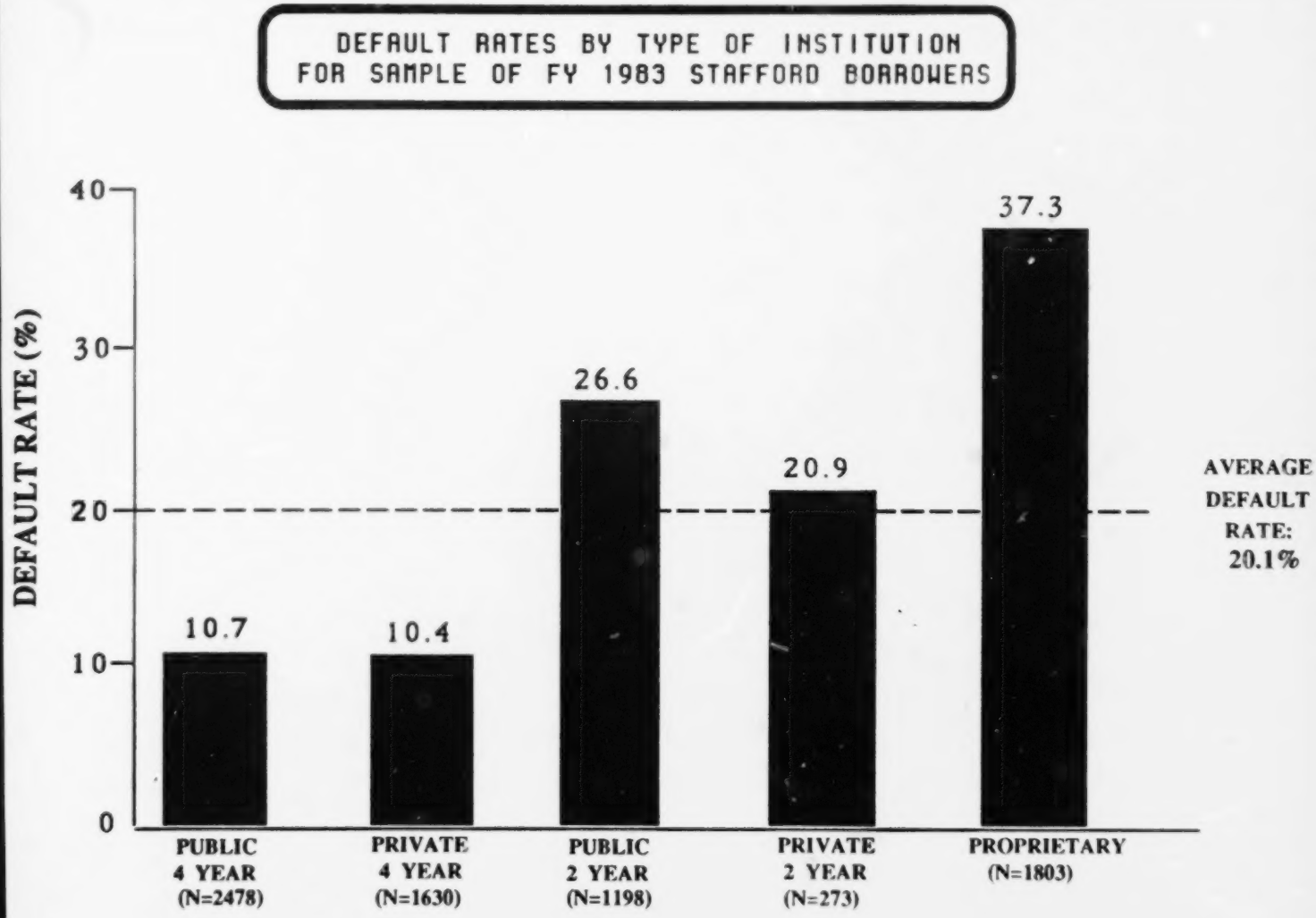
Table 1

COHORT DEFAULT RATES BY SELECTED CHARACTERISTICS FOR SAMPLE OF FY 1983 STAFFORD BORROWERS

TYPE OF INSTITUTION	Default Rate (%)	N
Public 4 Year	10.7	2,478
Private 4 Year	10.4	1,630
Public 2 Year	26.6	1,198
Private 2 Year	20.9	273
Proprietary	37.3	1,803
ADJUSTED GROSS INCOME		
$1 -$4,999	31.5	1,158
$5,000 -$9,999	28.4	927
$10,000-$14,999	22.4	830
$15,000-$19,999	16.9	649
$20,000-$24,999	11.7	615
$25,000-$29,999	8.5	625
$30,000 +	5.8	1,405
INDEPENDENT/ DEPENDENT STATUS		
Independent	28.6	2,527
Dependent	15.3	3,804
YEARS OF SCHOOLING		
Less than 1 year	33.1	2,881
1 year but less than 2	17.8	1,161
2 years but less than 3	12.1	802
3 years but less than 4	8.9	1,389
4 years or more	8.2	1,065
ENROLLMENT STATUS		
Graduated	15.5	3,030
Withdrawn	25.9	2,438
TOTAL SAMPLE	**20.1**	**7,394**

Source: Data were obtained from a random sample of 7,394 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section. Default rates are borrower rates, not dollar rates. N represents the number of cases from which default rates were calculated.

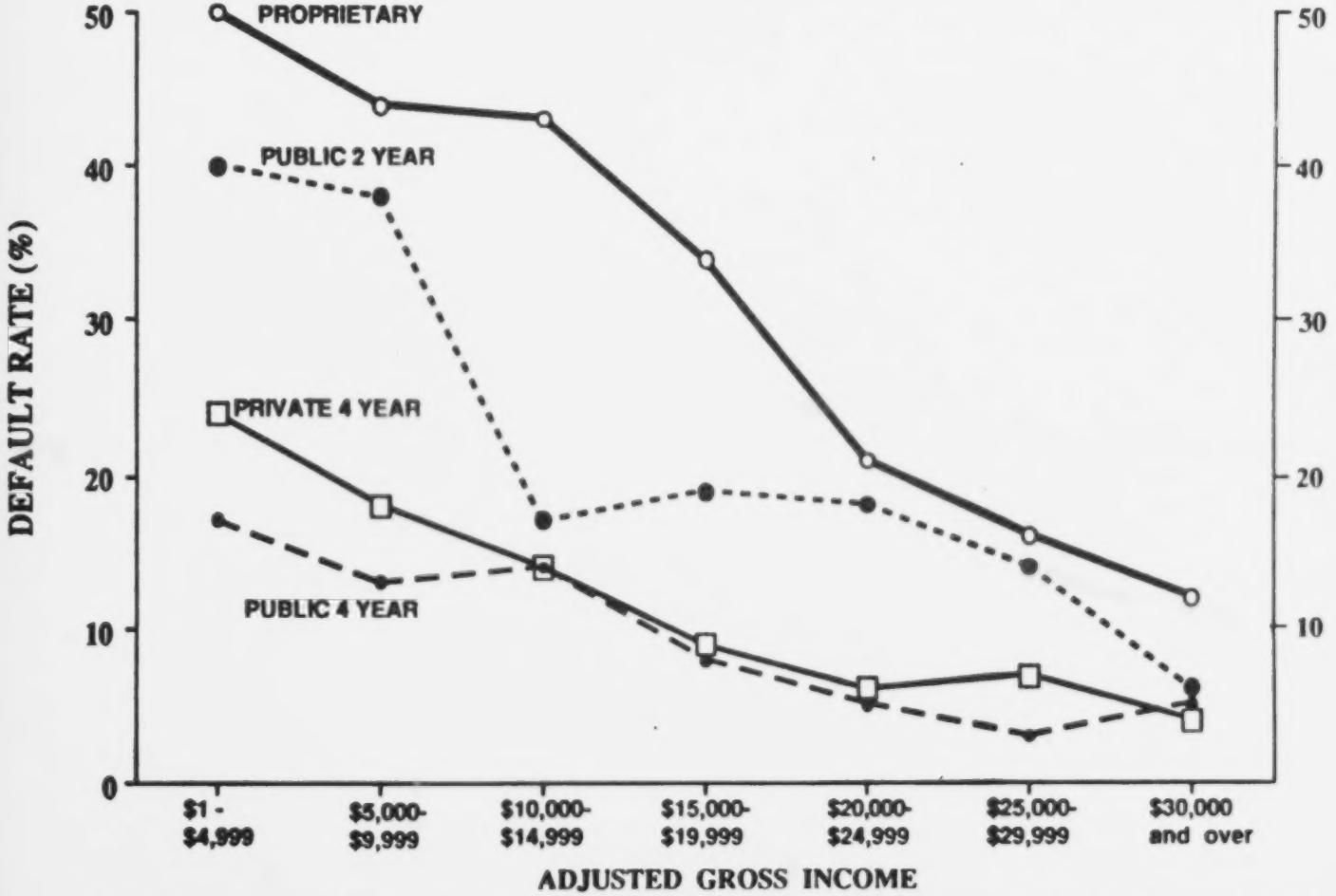
Figure 1



Source: Data were obtained from a random sample of 7,382 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OSFA/DPPD, Stafford Loan Branch, Analysis Section.

Figure 2

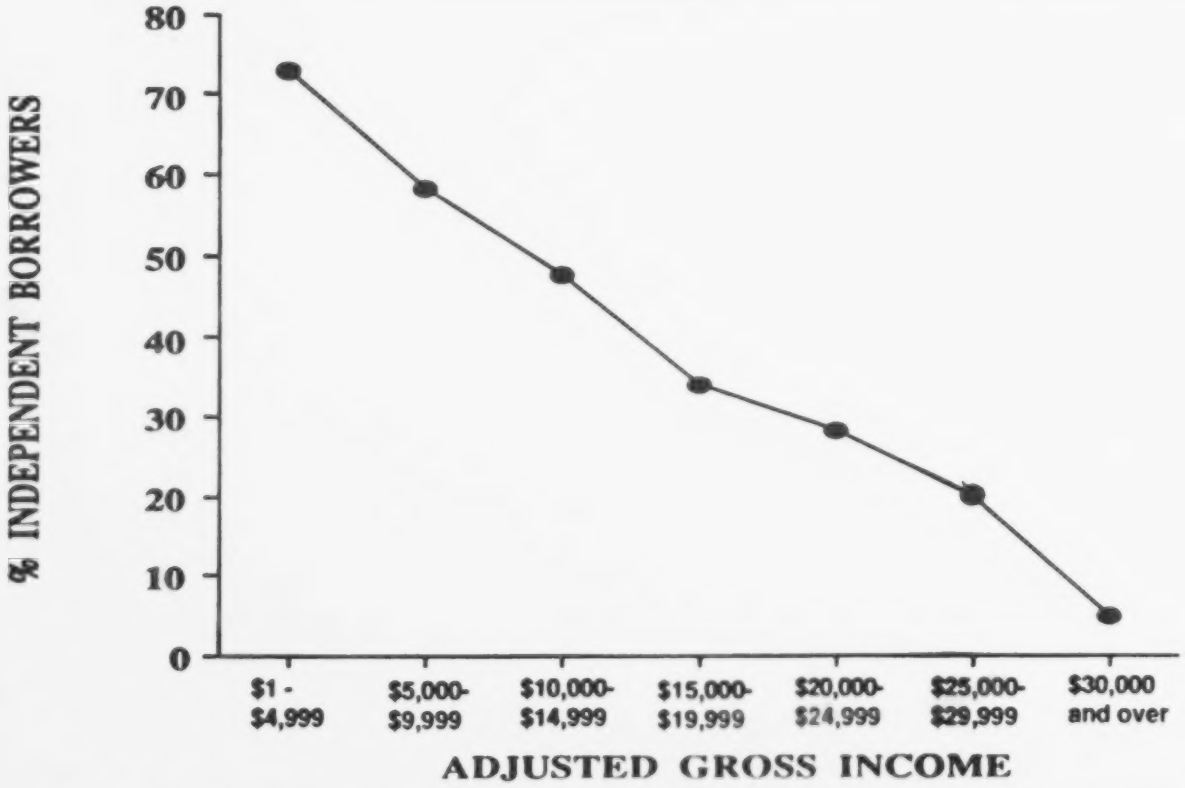
DEFAULT RATES BY TYPE OF INSTITUTION AND ADJUSTED GROSS INCOME FOR SAMPLE OF FY 1983 BORROWERS



Source: Data were obtained from a random sample of 8,202 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section.

Figure 3

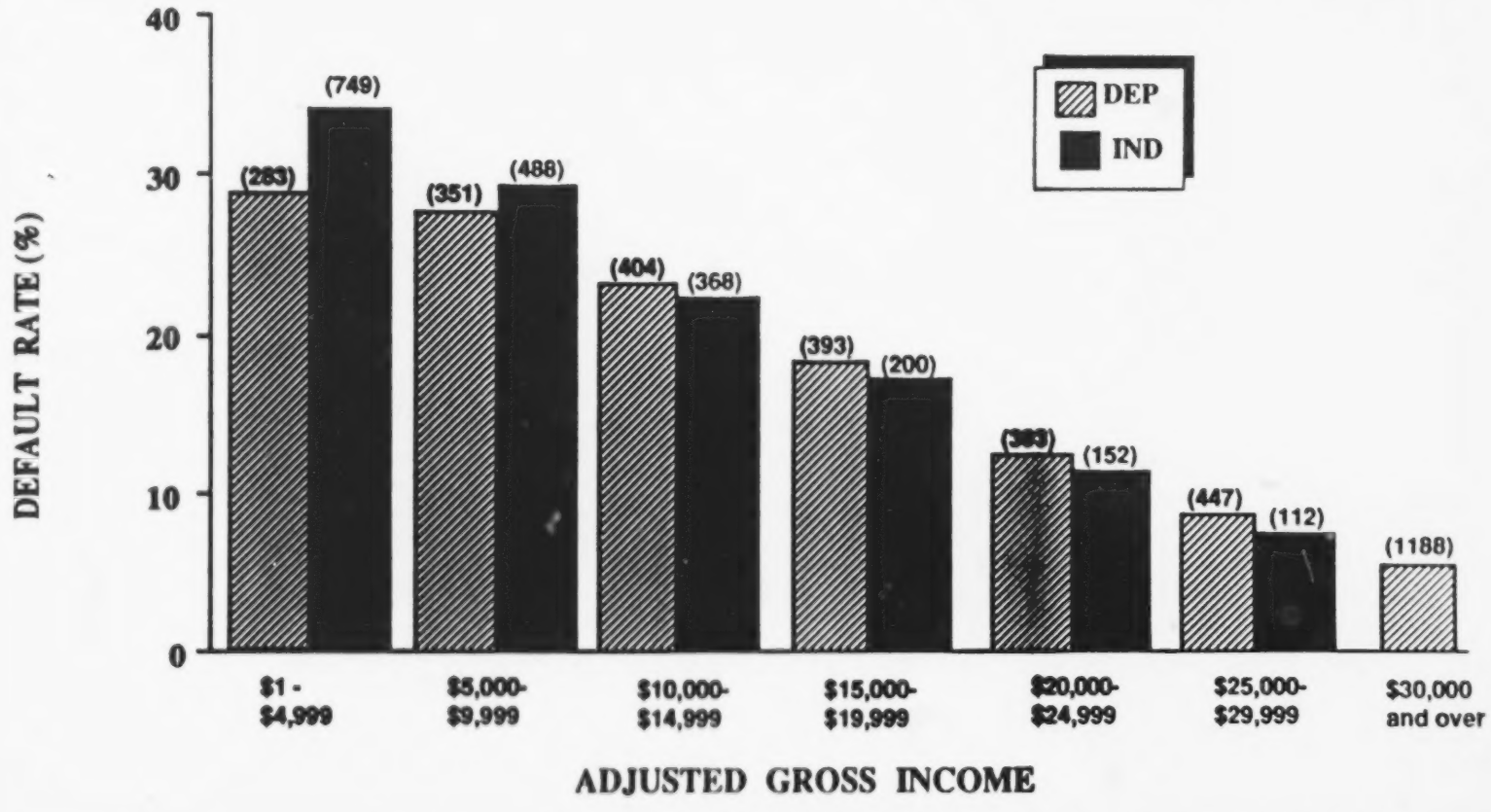
PERCENTAGE OF INDEPENDENT BORROWERS BY ADJUSTED GROSS INCOME FOR SAMPLE OF FY 1983 STAFFORD BORROWERS



Source: Data were obtained from a random sample of 5,591 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The sample was drawn from the FY 1987guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section.

Figure 4

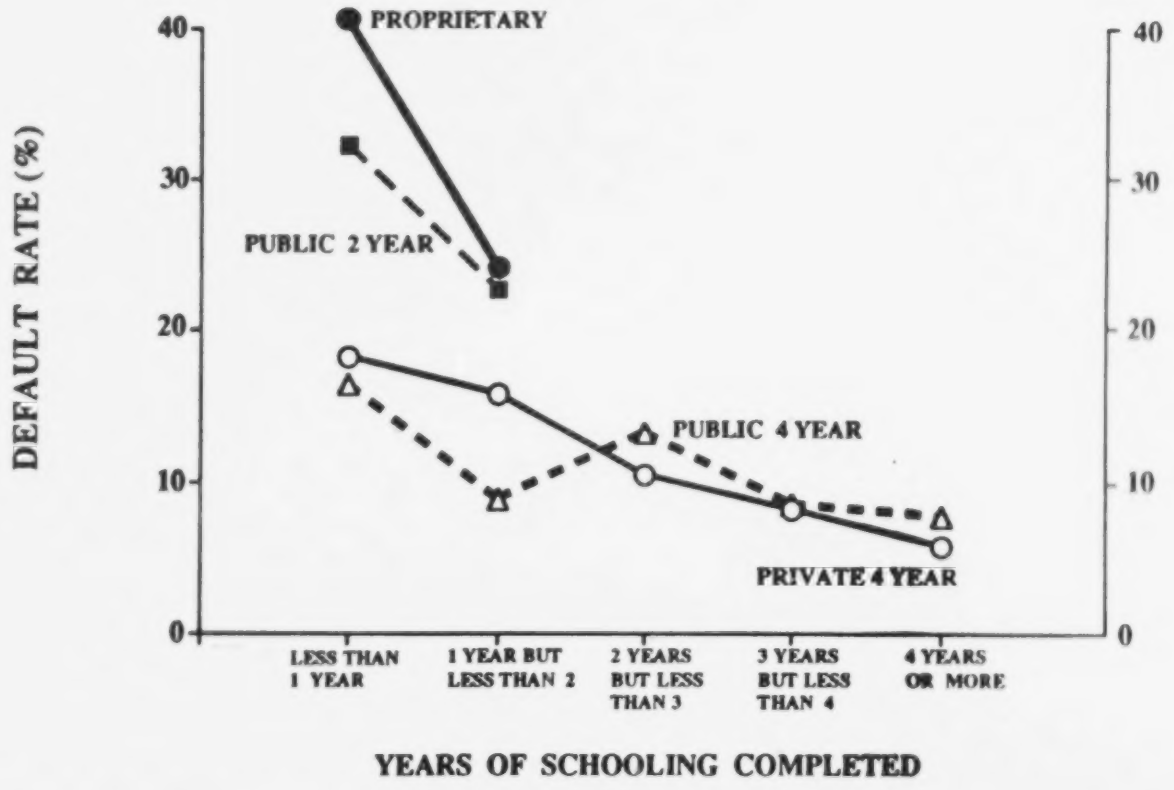
COMPARISON OF DEFAULT RATES BETWEEN DEPENDENT AND INDEPENDENT BORROWERS BY ADJUSTED GROSS INCOME FOR SAMPLE OF FY 1983 BORROWERS



Source: Data were obtained from a random sample of 5,591 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The number of cases for which default rates were calculated for each category are shown in parentheses above each bar. Default rates were not calculated for independent borrowers with incomes of $30,000 or greater due to a small number of cases. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section.

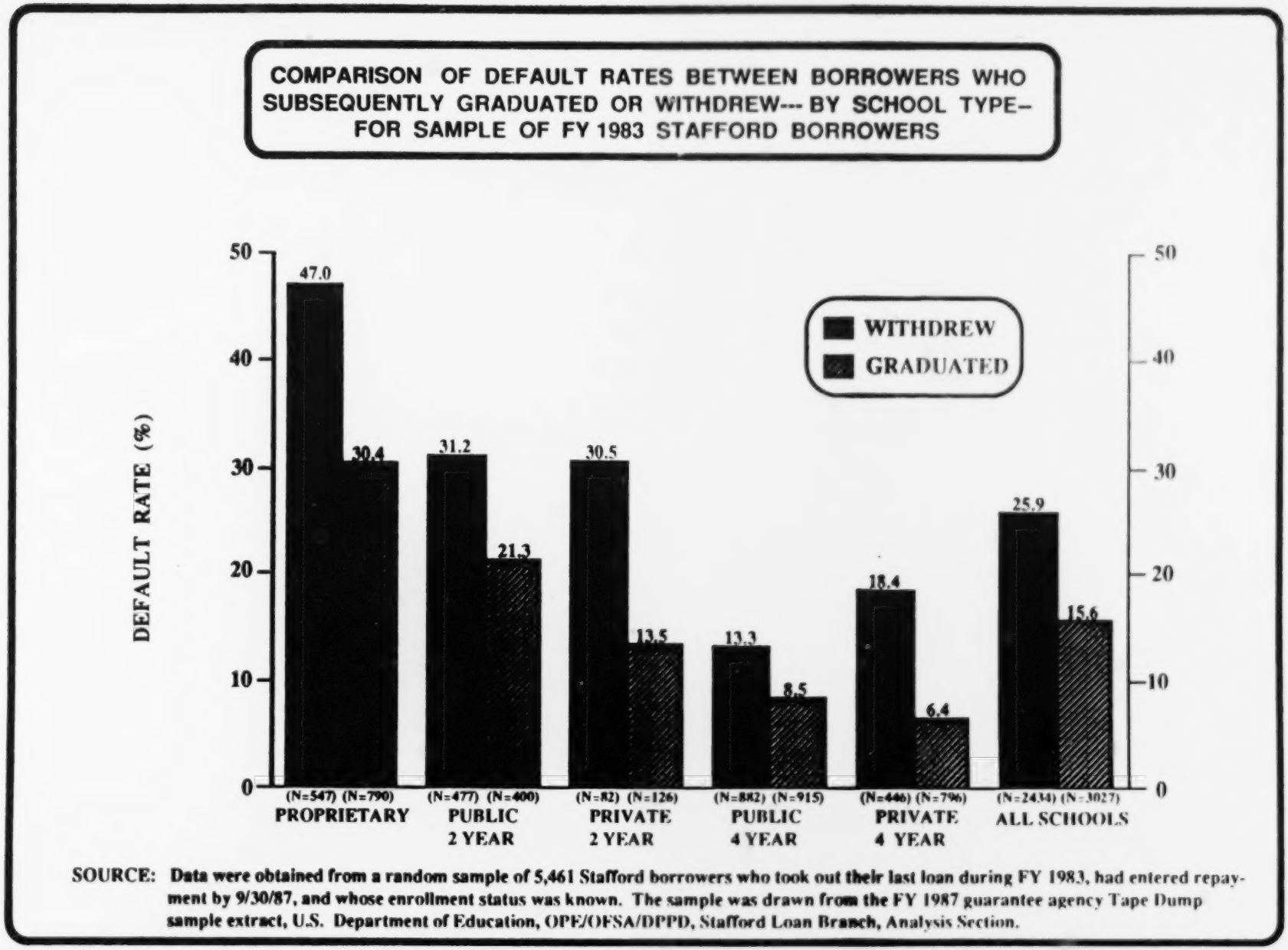
Figure 5

COMPARISON OF DEFAULT RATES BY YEARS OF SCHOOL COMPLETED AND SCHOOL TYPE FOR SAMPLE OF FY 1983 STAFFORD BORROWERS



SOURCE: Data were obtained from a random sample of 6,912 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. Sample sizes for years of schooling were: less than one year= 2,877; one year but less than two= 1,161; two years but less than three= 683; three years but less than four= 1,287; four years or more= 913. Two year private schools were not plotted due to a small number of cases. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U. S. Department of Education, OPE/OSFA/DPPD, Stafford Loan Branch, Analysis Section.

Figure 6



SOURCE: Data were obtained from a random sample of 5,461 Stafford borrowers who took out their last loan during FY 1983, had entered repayment by 9/30/87, and whose enrollment status was known. The sample was drawn from the FY 1987 guarantee agency Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section.

Table 2

REGRESSION OF DEFAULT STATUS ON SELECTED INDEPENDENT VARIABLES FOR SAMPLE OF 1983 BORROWERS

Variable	Beta Weight	N
Adjusted Gross Income	-.163	6,209
Years of Schooling	-.158	7,367
Non-Proprietary Institution	-.152	7,382
Withdrawn	.086	5,468
Independent Borrower	.070	6,331

Multiple Correlation (R)	.370
Coefficient of Determination (R^2)	.136

Source: Data were obtained from a random sample of 7,394 Stafford borrowers who took out their last loan during FY 1983 and had entered repayment by 9/30/87. The sample was drawn from the FY 1987 guarantee agency Stafford Tape Dump sample extract, U.S. Department of Education, OPE/OFSA/DPPD, Stafford Loan Branch, Analysis Section. Default rates are borrower rates, not dollar rates. N represents the number of cases from which default rates were calculated. For purposes of the regression analysis, the dependent vari able default status, was coded as either "0" (non- default) or "1" (default).